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AUTHOR Petrock, Edith M.
INSTITUTION Education Commission of the States, Denver, Colo. Education Programs Div.
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ABSTRACT

This paper discusses the rise and fall of energy education, justifies the commitment to achieve the goals of energy education, and suggests some strategies for accomplishing this objective. The rise of energy education is first discussed. Energy is not a newcomer to the K-12 school instructional program. Energy sources, forms, states, and uses have traditionally been part of the science curriculum at all grade levels. Social studies classes have always discussed energy in many contexts. The events of the 1960s and mid 1970s caused a shift in the way we wished to deal with energy in the schools. It evolved from a multi faceted area of interest to a complex area of concern. In the late 1970s many programs were begun by federal, state, and local educators demonstrating their commitment to create an energy literate society. The paper then goes on to discuss the four major reasons for the falling off of interest in energy education: pervasive sense of complacency; change in political ideology; fiscal constriction; and shift in educational priorities. The next section of the paper discusses why energy education is still important. Suggestions for promoting energy education in the classroom include becoming energy literate, maintaining a long-range perspective, not falling victim to a crisis mentality, and participating in the political process. The paper concludes with five guidelines for implementing energy education. (Author/RM)

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Education Commission of the States
Central Office
1860 Lincoln Street
Denver, Colorado 80295
Phone (303) 830-3600

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THE RISE AND FALL OF ENERGY EDUCATION

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by

Edith M. Petrock, Director
State Energy Education Project

Education Improvement Center
Education Programs Division

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THE RISE AND FALL OF ENERGY EDUCATION

Today I have the privilege of sharing with you my observations concerning the rise and fall of energy education, justifying continuing our commitment to achieve the goals of energy education, and suggesting some strategies to accomplish this objective. My remarks will be divided into four sections: I. The Rise of Energy Education, II. The Fall of Energy Education, III. Is Energy Education Still Important? and IV. What Can We Do To Promote Energy Education in the Classroom?

I. THE RISE OF ENERGY EDUCATION

Energy is not a newcomer to the elementary/secondary school instructional program. Energy sources, forms, states and uses have traditionally been part of the science curriculum at virtually all grade levels. Social studies classes have discussed energy in many contexts, including the evolution of civilization, the industrial revolution and comparative lifestyles.

During the 1960's -- when we witnessed a renewed awareness of man's relationship to the environment -- understanding, preserving and enhancing environmental quality became a mission of the schools. Energy development, distribution and utilization patterns were integral components of environmental education, which also tended to be implemented through science and social studies programs. The 1973-74 OPEC oil embargo added economics and international politics to the already extensive list of energy-related teachings to be incorporated into the curriculum.

Together, the events of the 1960's and mid-1970's caused a shift in the way we wished to deal with energy in the schools: it evolved from a multi-faceted area of <u>interest</u> to a complex area of <u>concern</u>. And, in the process, energy education acquired a name and a mission. No longer could we take pride in America's ability to turn huge quantities of low-cost fossil fuels into continuous economic prosperity and growth. Suddenly, energy scarcity, escalating prices, environmental degradation and an awareness of the political implications of depending upon foreign oil producers all contributed to our sense of energy as a "crisis" in need of resolution.

When, as United States citizens, we face a crisis, we expect three things to happen: First, federal and state governments must take action, they must create new policies, develop new programs and create a new beauracracy to implement these policies and programs. Second, the private sector is to respond with enlightened self-interest, offering information and services which meet public needs while creating private profits. Third, the nation's schools are expected to add new information to the curriculum and/or emphasize existing coverage so that students will understand the issue in all of its complexity and be able to cope with the associated problems now and in the future.

And, lo and behold, all three expectations were fulfilled. The federal government responded by creating the U.S. Department of Energy, charged with developing a national energy policy and a variety of programs to promote energy awareness, conservation and national independence. In addition, an Energy and Education Action Center was created within the U.S. Office of Education. State energy offices were formed, largely with federal funding, to collect and disseminate state-specific information and implement a combination of federal and state programs. Private initiatives included public information programs provided by utility and other energy-related companies and the development of energy education materials and conservation devices. The education sector responded both as a provider of information and as an energy consumer. State and local education agencies developed policies, offered energy-related inservice opportunities, and developed a variety of instructional programs at all grade levels. Individual teachers and administrators created and offered energy learning activities to meet student needs. Schools, as energy users, were caught unable to meet escalating energy costs and unable to cope with unpredictable supplies. Therefore, energy conservation programs became a management necessity, and implementing such programs often provided additional educational opportunities for school administrators, instructional and non-instructional personnel, students and community members.

In February of 1974, a research brief published by the Education Commission of the States (ECS) documented the education establishment's response to the energy crisis. Already, new programs stressing energy conservation and an awareness of our energy-related dilemmas had been developed and implemented by a significant number of states scattered throughout the nation.[1]

By 1978, when ECS surveyed governor's offices, state legislatures, state departments of education and state energy offices, we found that most state departments of education and most state energy offices had assigned a person (not necessarily full-time) to be responsible for elementary/secondary energy education. Furthermore, many agencies had adopted policies, rules, recommendations or guidelines regarding elementary/secondary energy education, generally through means of infusion into existing areas of instruction.[2] In 1978 the greatest problem seemed to be coordinating involved agencies and persons.

To meet this need, in 1979 ECS convened officials from state education agencies and energy offices for the purpose of stimulating interstate communication and cooperation. As an indication of interest, over forty states utilized their own funds to participate in this first Interstate Energy and Education Network Conference.[3]

However, while many federal, state and local educators and political officials were demonstrating a commitment to curb our energy dependence and to create an energy-literate society, others

were denying the existence of energy as a continuing problem. This complacency will be discussed below as one of four factors working counter to energy education today.

II. THE FALL OF ENERGY EDUCATION

The four major reasons responsible for a falling off of interest in energy education are the following: First is a pervasive sense of complacency, second is a change in political ideology, third is fiscal constriction, and fourth is a shift in educational priorities.

A. Complacency

By mid 1974 the oil embargo was over, and most Americans believed that the energy crisis had ended. Reminding us of our dependence upon relatively unstable middle eastern political regimes for half of our energy supply became an unpopular priority of the Carter Administration. Yet, public opinion polls conducted during 1977 and 1978 indicated that American citizens were not very concerned about energy-related problems,[4] and data from the National Assessment of Educational Progress confirmed that young adults (aged 26-35) were poorly informed about energy.[5] While the 1979 Iranian revolution temporarily shook Americans from their complacency, our ability to replace Iranian oil with other sources and our willingness to pay higher and higher prices gradually led to a lessening of concern. However, higher costs and the memory of shortages did motivate some behaviorial changes. Whether or not polls show a preoccupation with energy as a national issue, people have taken conservation measures to lessen the budgetary impact of escalating prices. This consumption curtailment has in turn reduced our oil imports.

People who are still too cautious to cease worrying about energy can find relief in the November cover story in Harper's, which proclaims that "The Energy Crisis Is Over!" In this article, William Tucker tries to explain "supply-side economics" and concludes that,

> The energy crisis, then, is half won. We have ended OPEC's dominance of the market within a few short months by swallowing what turned out to be a relatively mild pill and accepting a market price for our own oil. All we have to do now is decontrol our natural-gas prices, and we will be home free. There will be another mild period of adjustment, and soon we will be on a firm, stable, and innovative energy course.[6]

B. Political Changes

The political factors accounting for the decline in interest in energy education follow from the pervasive public perception

described above. The Reagan Administration's perspective is largely one of free market economics. The "reformulated energy-policy guidelines" that the Administration presented to Congress in July state that,

> Achieving a low level of U.S. imports at any cost is not a major criterion for the nation's energy security and economic health [because] even at its current high price, imported oil in some cases is substantially less expensive than available alternatives.[7]

Federal philosophy mirrors the widespread contention that energy is no longer a crisis. This belief is justified by the assumption that unfettered market forces will balance energy supply and demand at appropriate prices which, in turn, will stimulate domestic production of apparently unlimited energy resources.

Not only are we witnessing a decline in federal energy-related activities, but the federal role in education is also expected to decline as part of a rebalancing of federal, state, and local responsibilities.

C. Economic Factors

Even without the philosophical shifts described above, efforts to curb federal spending necessitate a reduction in both energy and education expenditures. The combination of these fiscal and programmatic shifts account for proposals to eliminate both DOE's -- and to replace current categorical programs in both energy and education with "block grants," characterized by fewer strings and less money.

Education in our nation is ultimately a state responsibility, with considerable authority delegated to local school districts. Prior to the most recent round federal budget cuts, the National Education Association estimated that elementary/secondary education expenditures for the 1981-82 school year would be shared by federal, state and local units of government in the following proportions: federal-9.0%, state-49.7%, and local-41.4%.

The magnitude of federal cuts in spending for both energy and education will not be known until the current budget battle is over. However, two things are already clear: First, substantially less federal money will be available for energy, education, and their intersection. Second, state and local funds will not fill the gaps left by federal austerity. For a myriad of reasons, state and local units of government are also facing fiscal crisis, and other priorities will successfully compete with energy education for scarce dollars.[8]

D. Shifts in Education Priorities

When the general public and its political officials feel that energy is no longer a crisis, then energy education automatically becomes less important. People seem to loose sight of the

profound changes we still face with respect to energy costs, development of traditional and emerging energy sources, and the social and environmental implications of the changes in our energy-use patterns. In the education arena, public opinion has now turned its attention to other issues of education quality. Are students learning as much as they can learn and are they able to function at acceptable levels of competency in such basic areas as reading, writing, computing, and speaking? Are teachers adequately trained and properly monitored? If, indeed, state education agencies and local school districts are facing a fiscal crunch, obviously resources will be focused on those areas considered to be most important, and other topics considered to be less important will suffer.

The combined impact of these four factors on energy education has been profound at the federal, state and local levels. There has been a rapid drop in the number of persons having assigned responsibility for energy education. The morale of those who remain in the field has sunk to a level of despair both from grief over the reduction in ranks and from fear of becoming part of that reduction in ranks. People who are still committed to providing energy education in the schools are faced with an end to the free distribution of energy education materials from the federal government. Perhaps the most notable exception to this pervasive constriction in energy education is the growing interest and involvement of the private sector. To the extent that private involvement in energy education occurs without undue bias and/or is balanced with different perspectives, then this trend can be considered a hopeful sign.

There are other bright spots as well. Our meeting today obviously illustrates that many teachers and school administrators do believe that energy must be an integral part of the school curriculum. Two weeks ago I attended an energy education meeting in Ohio which attracted far more people than the 175 person ceiling. We at ECS are working with the National Science Teachers Association to revitalize the energy and education network on a regional basis. Last week my colleague, Paul Bauman, participated in the first of these meetings, held in Minneapolis, and left the meeting with a sense that many state and local education and energy officials remain both interested and active.

After reviewing the reasons for the rise and fall of energy education, we must honestly ask ourselves whether or not energy education is still important and, if we answer affirmatively, then we must also consider what we can do to assure the implementation of useful programs. I will devote the remainder of my remarks to these two tasks.

III. IS ENERGY EDUCATION STILL IMPORTANT?

In answering this question, I'd like to quote from a booklet I wrote earlier this year, entitled Energy Education: A Policy

Development Handbook. This publication grew out of the work of the State Energy Education Project, funded by the U.S. Department of Energy and assisted by a national task force composed of educators and political officials chaired by Governor Richard Lamm of Colorado. The handbook justifies energy education in the following manner:

> Within the last 10 years, energy has become central to the national consciousness and to individual expectations. Traditional assumptions regarding continual improvement in material well-being are being challenged by unpredictable supplies and unprecedented costs for the energy upon which the American lifestyle is based. With respect to fossil fuels, the United States is experiencing a painful transition from abundance to possible scarcity, from cheap to expensive and from national independence to dependence and perhaps back again. With respect to alternate energy sources, people are polarized by controversy over nuclear safety and are confused by conflicting claims over the potential costs and benefits of solar energy. Meanwhile, nobody is immune from the ravages of an inflationary economy which has been exacerbated by spiraling energy costs. Meeting the multi-faceted challenge that the energy transition presents requires an informed citizenry capable of making responsible decisions about the development and use of alternative energy supplies having various economic, political, social and environmental consequences. Such a requirement suggests that energy be considered a basic theme throughout the formal (in-school) and informal (out-of-school) education systems, as energy issues are immediate, serious and pervasive.[9]

After affirming of the continuing importance of energy education, I'd like to suggest that the purposes of energy education are twofold: first, to enable people to understand basic energy concepts, and second, to enable people to make informed decisions regarding energy conservation, development and utilization with an understanding of options and consequences.[10]

IV. WHAT CAN WE DO TO PROMOTE ENERGY EDUCATION IN THE CLASSROOM?

1. Become Energy Literate

My first recommendation to you is to educate yourself about energy and about energy education for two purposes: first, to be an effective advocate for energy education, and second, to be an effective teacher of energy education. With respect to your advocacy role, I suggest that you get a copy of Energy Education: Why, What and How. This document will be available early in December, at no cost, from the State Energy Education Project, Education Commission of the States, 1860 Lincoln, Suite 300, Denver, Colorado 80295. Based on suggestions from our national energy education task force, Paul Bauman and I designed this publication to convince education policymakers of the importance

of energy education and the feasibility of incorporating energy concerns into the elementary/secondary school curriculum. Its three sections explain the importance of energy education, set forth six basic objectives for a comprehensive energy education program, and provide suggestions for implementing energy education programs at relatively low cost. Furthermore, the booklet provides a rather extensive bibliography of organizations and agencies able to provide free or low-cost materials. With respect to your effectiveness in the classroom, I urge you to learn as much as you can about the energy-related content appropriate to your subject areas and grade levels. You must move beyond the emotional and preconceived perspectives in a subject as complex and polarized as energy issues. You must also be informed about the current status of federal and state policies and programs addressing energy and education. Furthermore, as a side effect, your personal involvement in the energy learning process will serve as a model to stimulate your students to do likewise.

2. Maintain a Long-range Perspective

Because you are involved with students, you are not only concerned with your lifespan but also with the lifespan of present and future generations. Your responsibility is to prepare your students to face an unknown future equipped with the tools of critical thinking, decisionmaking, and flexibility. You want to prepare your students to exercise some control over their lives so that they are not continually the victims of a series of crises. This mission requires facing our energy uncertainties as they relate to the supply, development and utilization of renewable and nonrenewable energy sources and the environmental, social, economic and political implications of the choices before us.

3. Do Not Fall Victim to a "Crisis Mentality"

The issue is not whether or not energy is a crisis. The facts that life depends upon energy, energy use patterns largely determine human lifestyles, and the distribution of energy resources affects economic and political relationships make energy important enough to be a part of the school curriculum. The pervasive importance of energy, however, does not mean that it must be pitted against such other curricular topics as health, career and consumer education for a spot in the curriculum. If schools are to assist students to function in their world, then there must be room for content that provides students with their needed tools. Part of the ongoing curricular adjustment process must be to keep educational programs synchronized with societal needs.

4. Participate in the Political Process

To be an effective advocate for energy education, you must be willing to participate in the political process. Play a role in the selection of candidates so that persons elected to public

office will share your belief in energy as an issue worthy of public attention. Tell public officials about energy and education needs in order to influence the determination of public priorities and budget allocations. And, work to develop a policy basis for energy education. Not only can a policy indicate a high level of official commitment to the goals and objectives of energy education, but it also can provide the basis for appropriate support and assistance.[11]

Finally, I'd like to share with you the five implementation guidelines described in Energy Education: Why, What and How.

Guideline 1: Cost-Effectiveness

As explained in our publication,

> Limited federal and state support for program development combined with school districts' tight budgets necessitates the use of cost-saving methods and techniques whenever possible. Therefore, an energy education program must be developed as economically as possible while maintaining quality standards. Existing resources, information and expertise should be located and used whenever they are relevant and appropriate, thus avoiding duplication of effort and unnecessary expenditures.[12]

Guideline 2: Curricular Considerations

A comprehensive energy education program must be carefully planned with respect to scope, sequence and instructional strategy. Most energy education programs have been designed to be infused into existing classes. In many cases it may be sufficient merely to emphasize the energy-related content already present in a given class. A third approach is the building of an interdisciplinary curriculum around an energy theme. A fourth strategy is the development of separate courses designed to address energy issues in greater detail or to provide students with vocational training.

Guideline 3: Objectivity

Again, quoting from Energy Education: Why, What and How,

> In order to be truly valuable and useful, an energy education program must be objective and impartial. It must be designed to provide factual information enabling people to draw their own conclusions and to make more informed decisions regarding energy questions and issues.
>
> ...
>
> In developing and selecting programs, it is important to include a coalition of teachers, school administrators, industry representatives, parents, students and community

leaders. . . . In this way a greater diversity of technical and policy options can be considered, and the concerns of individuals and organizations having different viewpoints will not be overlooked.[13]

Guideline 4: Relevance

By focusing on local, state and regional concerns, students can gain a very personal understanding of their dependence upon energy and of the issues which they can help to resolve.

Guideline 5: Teacher Preparation and Participation

The fifth and final implementation guideline, the need for teacher preparation and participation, confirms the importance of this National Conference on Energy Education. Teachers must become knowledgeable about energy concepts in order to address them effectively in the classroom. Energy literacy can result from preservice training, inservice programs and individual initiative. Responsibility for teacher preparation must be shared among colleges and universities, state and local education agencies, and individual classroom teachers, consultants and administrators.

Closely related to teacher preparation is the importance of teacher participation in determining both broad and operational energy education objectives, selecting and/or developing appropriate materials, and implementing school energy education programs.

My concluding observation is that energy education is now at the threshold of what may be its continuing fall or its second rising. If we believe that energy has an important place in the classroom, then we must work together to make this possible by articulating our commitment and by implementing a variety of good energy education programs. While the task is large, we can take comfort in knowing that a plethora of material and human resources are available. They can be found through bibliographic listings and through the valuable interaction afforded by this timely gathering.

FOOTNOTES

1. Doris Ross, Education's Response to the Energy Crisis: A Survey of the States, Research Brief Vol. 2, No. 1 (Denver: ECS, February 1974).

2. Energy Information Associates, The Status of State Energy Education Policy, Report No. 122 (Denver: ECS, March 1979).

3. Gary Smith, Building An Interstate Energy and Education Network: A Conference Report (Denver: ECS, June 1979).

4. Gallup Poll, "Energy Shortage 'Critical' to 1 in 4," June 6, 1977; Gallup Poll, "Few Fully Informed on Energy Problems," May 1, 1977; Gallup Poll, "Majority Still Uninformed on Extent of Energy Crisis," April 30, 1978; Cambridge Reports, Inc., Poll for the Alliance to Save Energy, Summer 1978; and others.

5. National Assessment of Educational Progress, Energy Knowledge and Attitudes, Report No. 08-E-1 (Denver: ECS, December 1978).

6. William Tucker, "The Energy Crisis Is Over," Harper's, November 1981, p. 36.

7. "Reagan Unveils New Energy Policy Plan," Science News, Vol. 120, p. 68.

8. "State & Local Government in Trouble: A Special Report" Business Week, October 26, 1981, pp. 135-181.

9. Edith Petrock, Energy Education: A Policy Development Handbook, Report No. 142 (Denver: ECS, August 1981), p. 3.

10. For a comprehensive discussion of six energy education objectives based on these basic purposes, see Paul Bauman and Edith Petrock, Energy Education: Why, What and How? Report No. 181-1 (Denver: ECS, October 1981).

11. See Energy Education: A Policy Development Handbook for an explanation of the purpose of a policy foundation, a suggested policy development and implementation process, and important issues to be considered in developing energy education policies and programs.

12. Energy Education: Why, What and How? p. 15.

13. Ibid., p. 18.